



## DIVERSITY AND ETHNOBOTANICAL USES OF WILD EDIBLE FRUITS IN MIZORAM, NORTHEAST INDIA

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### ABSTRACT

A study of wild edible fruits in Mizoram selected districts was carried out to assess the diversity and its ethnobotanical importance. During the study period fifty-one species belonging to 31 families were encountered with local folk name, used by different ethnic group and available districts. Among them 40 were trees, 5 shrubs, 5 climbers and 1 herb. The importance of documenting the wild edible fruits is important because of rapid loss of biodiversity due to anthropogenic activities and will help in conservation of the valuable wild edible species.

### KEY WORDS

Ethnic groups, Mizoram, Wild edible fruits, Ethnic uses

### INTRODUCTION:

Wild fruits have been good sources of food from time immemorial may be consumed when food source is scarce (Rasingam, 2012) and a source of various nutrients. The term wild refers to non-cultivated plants gathered in the field (Tardio *et al.*, 2006). Wild fruits make up the greatest percentage of wild food plants and many wild fruits are eaten worldwide (FAO 2011) as raw, unripe and cooked form. However, consumption of wild fruits has gradually decreased due to the introduction of exotic fruits (Deshmukh, 2011). The collection and consumption of wild fruits have played an important role in indigenous community for their day to day life (Jeeva, 2009). Verheij and Coronel (1991) provided a comprehensive review of edible fruits and nuts in Southeast Asia with a total number of 795 species along with a revival of interest in wild edible fruits among different workers in India, Northeastern India and World (Jeeva, 2009; Sankaran *et al.*, 2006 and Jin *et al.*, 2009).

In the present context of study there are very few studies conducted on edible wild fruits in the region, so the study aimed to enumerate, identify different edible fruit species in the study region and to harness the rich ethnobotanical uses among the different ethnic groups. The study proposes in increasing the awareness among the local and to boost the importance of different wild edible species.

### MATERIALS AND METHODS:

Mizoram is situated in the extreme end of the Himalayan ranges in the North Eastern part it is located between 21° 58' N and 24° 35' N latitude and 92° 16' E and 93° 29' E longitudes (Pachau, 1994). The studied districts Aizawl, Champhai, Lawngtlai and Saiha have predominantly mountainous terrain; mountain ranges run in north to south direction, the soil in general young, immature, moderate to acidic. The districts enjoy a pleasant, moderate climate warm in summer and cold in winter with an average rainfall of 2500mm per annum, the temperature varies from 11°C to 35°C, forest cover in the region is tropical wet evergreen type and the region is rich in biodiversity with

many endemic flora and fauna. The districts constitute six major different ethnic groups Mizo, Mara, Lai, Pang, Bawm and Chakma rich ethnobioculturally on the use of biodiversity and folk knowledge.

Field visits were conducted during January 2015 - December, 2016 covering different villages and natural reserves inhabited by different ethnic groups of the region. During the visits to the village transect walks in natural reserve, secondary forest in around the region to collect wild edible fruit species. Interviews with knowledgeable villagers, local market observations and plant material collection carried out during field visit and record the ethnobotanical information local name for the species. The plant sample collected processed following the method of plant collection and herbarium technique (Jain and Rao, 1977). The specimen collected identified with the help of relevant floras and standard literature (Hooker, 1984; Kanjilal *et al.*, 1982a; 1982b).

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#### RESULTS AND DISCUSSION:

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The study reveals the diversity of wild edible fruits in the four different districts a total of 51 species belonging to 31 families identified. The dominant family with the maximum number of species eight belong to Moraceae followed by Phyllanthaceae and Rosaceae with four species each, Anacardiaceae, Asteraceae and Clusiaceae with three species each, Burseraceae with two species, Actinidiaceae, Annonaceae, Apocyanaceae, Asclepiadaceae, Begoniaceae, Canninaceae, Combretaceae, Dilleniaceae, Ebenaceae, Elaeagnaceae, Elaeocarpaceae, Leguminosae, Malastomataceae, Meliaceae, Menispermaceae, Myricaceae, Myrtaceae, Primulaceae, Rhamnaceae, Rubiaceae, Sabiaceae, Styracaceae, Symplocaceae and Vitaceae with one species each. (Table 1 and Figure 1)

The status on the habit of the wild edible fruit species in the studied four districts show the dominant species trees, followed by climbers, shrubs and herb as such trees 40 species (78%), Climbers 5 species (10%), Shrubs 5 species (10%) and herb 1 species (2%). (Table 1 and Figure 2)

The study on the ethnic group uses of the different species maximum species used by Mizo 48 species (31%), followed by Lai 42 species (27%), Mara 27 species (17%), Chakma 18 species (11%), Pang 17 species (11%) and Bawm with only 5 species (3%). (Table 1 and Figure 3)

**Table 1: Wild edible fruit species with family, local name, habit, ethnic group(s), ethnobotanical use(s) and available district(s).**

| Sl.No. | Name of Plants                                   | Family         | Local Name     | Habit | Ethnic Group                        | Ethnobotanical use(s)                           | Available Districts                |
|--------|--|----------------|----------------|-------|-------------------------------------|---|------------------------------------|
| 1.     | <i>Aglaiia edulis</i> (Roxb.) Wall.              | Meliaceae      | Raithei        | Tree  | Mizo, Mara                          | Furniture, Boat, House posts, Firewood          | Aizawl, Saiha                      |
| 2.     | <i>Alphonsea lutea</i> (Roxb.) Hook.f. & Thomson | Annonaceae     | Zawngbalhla    | Tree  | Mizo, Lai, Pang                     | Firewood  | Aizawl, Lawngtlai                  |
| 3.     | <i>Antidesma bunius</i> (L.) Spreng.             | Phyllanthaceae | Ṭuaiṭit        | Tree  | Mizo, Mara                          | Firewood, Medicine, Bark for making rope        | Aizawl, Champhai, Saiha            |
| 4.     | <i>Aphananthe cuspidata</i> (Blume) Planch.      | Cannabaceae    | Theisehret     | Tree  | Mizo, Mara                          | House construction, Rafter, Firewood, Charcoal  | Aizawl, Saiha                      |
| 5.     | <i>Artocarpus chama</i> Buch. -Ham.              | Moraceae       | Tatkawng       | Tree  | Mizo, Lai, Pang, Mara, Bawm, Chakma | House construction, Furniture, Medicine, Fodder | Aizawl, Lawngtlai, Champhai, Saiha |
| 6.     | <i>Artocarpus lacucha</i> Buch. -Ham.            | Moraceae       | Theitat        | Tree  | Mizo, Lai, Chakma                   | House construction, Furniture, Firewood, Fodder | Aizawl, Champhai, Lawngtlai, Saiha |
| 7.     | <i>Baccaurea ramiflora</i> Lour.                 | Phyllanthaceae | Pangkai        | Tree  | Mizo, Lai, Mara, Chakma, Pang       | Medicine  | Aizawl, Champhai, Lawngtlai, Saiha |
| 8.     | <i>Begonia roxburghii</i> A.DC.                  | Begoniaceae    | Sekhupthur     | Herb  | Mizo, Lai                           | Medicine  | Aizawl, Champhai, Lawngtlai        |
| 9.     | <i>Bruinsmia polysperma</i> (C.B.Clarke) Steenis | Styracaceae    | Theipalingkawh | Tree  | Mizo, Lai, Mara                     | House construction, Firewood, Medicine          | Aizawl, Lawngtlai, Saiha           |
| 10.    | <i>Calamus erectus</i> Roxb.                     | Arecaceae      | Thilthek       | Shrub | Mizo, Lai, Mara                     | Thatching, Vegetable                            | Aizawl, Lawngtlai, Saiha           |
| 11.    | <i>Caryota mitis</i> Lour.                       | Arecaceae      | Meihle         | Tree  | Mizo, Lai, Mara                     | Medicine  | Aizawl, Lawngtlai, Saiha           |

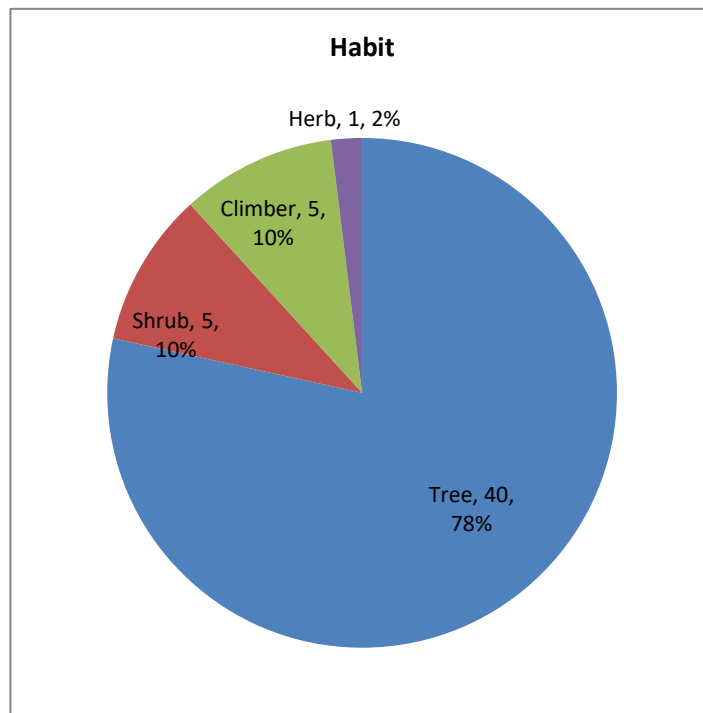
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|-----|---|----------------|--------------|---------|-------------------------------------|--|------------------------------------|
| 12. | <i>Cleistanthus monoicus</i> (Lour.) Müll.Arg.            | Phyllanthaceae | Phaktel      | Tree    | Mizo, Lai,                          | House construction, Firewood           | Aizawl, Lawngtlai                  |
| 13. | <i>Dillenia indica</i> L.                                 | Dilleniaceae   | Kawrthindeng | Tree    | Lai, Chakma, Mara                   | Medicine                               | Lawngtlai, Saiha                   |
| 14. | <i>Diospyros malabarica</i> (Desr.) Kostel.               | Ebenaceae      | Theikum      | Tree    | Mizo, Lai, Pang                     | House construction, Firewood, Medicine | Aizawl, Lawngtlai                  |
| 15. | <i>Elaeagnus caudata</i> Schltdl. ex Momiy.               | Elaeagnaceae   | Sarzukpui    | Shrub   | Mizo, Lai, Mara, Chakma             | Medicine                               | Aizawl, Lawngtlai, Champhai, Saiha |
| 16. | <i>Elaeocarpus rugosus</i> Roxb. ex G.Don                 | Elaeocarpaceae | Theikelek    | Tree    | Mizo, Mara                          | House construction, Firewood           | Aizawl, Saiha                      |
| 17. | <i>Embelia vestita</i> Roxb.                              | Primulaceae    | Tling        | Climber | Mizo, Lai, Mara, Pang               | Vegetable, Medicine                    | Aizawl, Champhai, Lawngtlai, Saiha |
| 18. | <i>Ficus auriculata</i> Lour.                             | Moraceae       | Theibal      | Tree    | Mizo, Lai                           | Vegetable, Fodder                      | Aizawl, Lawngtlai                  |
| 19. | <i>Ficus prostrata</i> (Wall. ex Miq.) Buch.-Ham. ex Miq. | Moraceae       | Theitit      | Tree    | Mizo, Lai, Mara                     | Firewood, Medicine                     | Aizawl, Champhai, Lawngtlai, Saiha |
| 20. | <i>Ficus racemosa</i> L.                                  | Moraceae       | Thei-chek    | Tree    | Mizo, Lai                           | Firewood, Dye, Medicine, Fodder        | Aizawl, Lawngtlai                  |
| 21. | <i>Ficus religiosa</i> L.                                 | Moraceae       | Hmawng       | Tree    | Mizo, Lai, Pang, Chakma             | Firewood, Charcoal, Medicine, Fodder   | Aizawl, Champhai, Lawngtlai, Saiha |
| 22. | <i>Ficus semicordata</i> Buch.-Ham. Ex Sm.                | Moraceae       | Theipui      | Tree    | Mizo, Chakma, Lai, Pang, Bawm, Mara | Medicine                               | Aizawl, Lawngtlai, Saiha, Champhai |
| 23. | <i>Garcinia lanceifolia</i> Roxb.                         | Clusiaceae     | Chengkek     | Shrub   | Mizo, Lai, Mara, Chakma             | Vegetable, Medicine                    | Aizawl, Lawngtlai, Saiha           |

|     |  |                 |               |         |                               |   |                                    |
|-----|--|-----------------|---------------|---------|-------------------------------|---|------------------------------------|
| 24. | <i>Garcinia sopsopia</i> (Buch.-Ham.) Mabb.            | Clusiaceae      | Vawmva        | Tree    | Mizo, Lai, Pang               | Medicine  | Aizawl, Lawngtlai                  |
| 25. | <i>Garcinia xanthochymus</i> Hook.f. ex T.Anderson     | Clusiaceae      | Tuaihabeh     | Tree    | Mizo, Lai                     | Firewood, Dye, Medicine                                       | Aizawl, Lawngtlai                  |
| 26. | <i>Garuga pinnata</i> Roxb.                            | Burseraceae     | Bungbutuairam | Tree    | Mizo, Lai, Chakma             | House constuction, Furniture, Firewood, Medicine, Fodder, Dye | Aizawl, Lawngtlai                  |
| 27. | <i>Haematocarpus validus</i> (Miers) Bakh.f. ex Forman | Menispermaceae  | Theichhungsen | Climber | Mizo, Lai                     | Fodder  | Aizawl, Lawngtlai                  |
| 28. | <i>Licuala peltata</i> Roxb. Ex Buch.-Ham.             | Arecaceae       | Laisua        | Tree    | Lai, Mara                     | Vegetable, Medicine, Thatching                                | Lawngtlai, Saiha                   |
| 29. | <i>Mangifera sylvatica</i> Roxb.                       | Anacardiaceae   | Haifavang     | Tree    | Lai, Chakma, Mizo             | House Construction, Furniture, Vegetable                      | Aizawl, Champhai, Lawngtlai        |
| 30. | <i>Meliosma pinnata</i> (Roxb.) Maxim.                 | Sabiaceae       | Bungthei      | Tree    | Lai, Pang, Chakma             | Firewood, Vegetable, Fodder                                   | Lawngtlai                          |
| 31. | <i>Memecylon celastrinum</i> Kurz                      | Melastomataceae | Theikawrak    | Tree    | Mizo, Lai                     | Firewood, Tool handle   | Lawngtlai                          |
| 32. | <i>Morus alba</i> L.                                   | Moraceae        | Thingtheihmu  | Tree    | Mizo, Lai, Mara, Pang         | Medicine  | Aizawl, Champhai, Lawngtlai, Saiha |
| 33. | <i>Myrica esculenta</i> Buch.-Ham ex D.Don             | Myricaceae      | Keifang       | Tree    | Mizo                          | Medicine  | Aizawl, Champhai                   |
| 34. | <i>Neonauclea purpurea</i> (Roxb.) Merr.               | Rubiaceae       | Lungkhup      | Tree    | Mizo, Lai                     | House posts, Firewood, Rice stirrer                           | Aizawl, Lawngtlai                  |
| 35. | <i>Pentanura khasiana</i> Kurz.                        | Asclepiadaceae  | Theikelki     | Climber | Mizo, Lai, Mara               | Fodder  | Aizawl, Champhai, Lawngtlai, Saiha |
| 36. | <i>Phyllanthus emblica</i> L.                          | Phyllanthaceae  | Sunhlu        | Tree    | Mizo, Lai, Mara, Pang, Chakma | Medicine  | Aizawl, Champhai, Lawngtlai, Saiha |

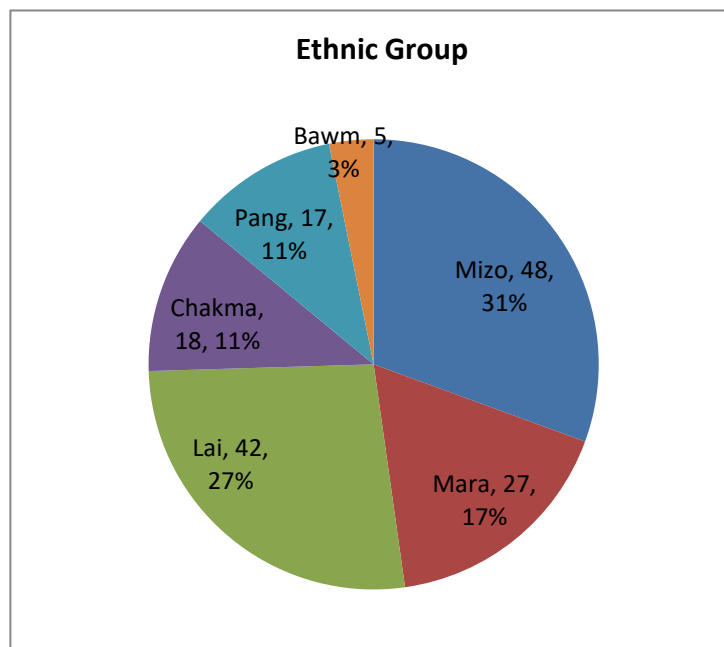
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|-----|--|---------------|-------------|-------|--------------------------------------|---|------------------------------------|
| 37. | <i>Protium seratum</i> (Wall. ex Coleebr.) Engl. | Burseraceae   | Bil         | Tree  | Mizo, Lai, Chakma, Mara, Pang, Bawm, | Furniture, House-post, Firewood, Charcoal | Aizawl, Lawngtlai, Saiha, Champhai |
| 38. | <i>Prunus bracteopadus</i> Koehne                | Rosaceae      | Lumlerh     | Tree  | Mizo                                 | House construction, Furniture             | Aizawl, Champhai                   |
| 39. | <i>Prunus undulata</i> Buch.-Ham. ex D.Don       | Rosaceae      | Theiarlung  | Tree  | Mizo, Lai, Mara                      | Dye                                       | Aizawl, Champhai, Lawngtlai, Saiha |
| 40. | <i>Rhus semiata</i> Murray                       | Anacardiaceae | Khawmhma    | Tree  | Mizo, Lai, Mara                      | Firewood, Medicine                        | Aizawl, Champhai, Lawngtlai, Saiha |
| 41. | <i>Rubus ellipticus</i> Sm.                      | Rosaceae      | Hmuṭau      | Shrub | Mizo, Lai, Mara                      | Medicine                                  | Aizawl, Champhai, Lawngtlai, Saiha |
| 42. | <i>Rubus birmanicus</i> Hook. f.                 | Rosaceae      | Sialinuchhu | Shrub | Mizo, Lai, Mara, Pang, Chakma        | Medicine                                  | Aizawl, Champhai, Lawngtlai, Saiha |
| 43. | <i>Saurauia punduana</i> Wall.                   | Actinidiaceae | Tiar        | Tree  | Mizo                                 | Firewood, Charcoal                        | Aizawl, Champhai                   |
| 44. | <i>Spondias pinnata</i> (L. f.) Kurz             | Anacardiaceae | Tawitaw     | Tree  | Mizo, Lai, Chakma, Mara, Pang, Bawm, | Medicine                                  | Aizawl, Champhai, Lawngtlai, Saiha |
| 45. | <i>Symplocos racemosa</i> Roxb.                  | Symplocaceae  | Keite       | Tree  | Mizo                                 | Firewood, Dye, Medicine                   | Aizawl, Champhai                   |
| 46. | <i>Syzygium cumini</i> (L.) Skeels               | Myrtaceae     | Lenhmui     | Tree  | Mizo, Lai, Pang, Bawm                | Medicine                                  | Aizawl, Lawngtlai                  |
| 47. | <i>Tamarindus indica</i> L.                      | Leguminosae   | Tengtere    | Tree  | Mizo, Lai, Mara, Pang, Chakma        | Medicine                                  | Aizawl, Lawngtlai, Saiha           |

|     |   |              |            |         |                         |   |                          |
|-----|---|--------------|------------|---------|-------------------------|---|--------------------------|
| 48. | <i>Terminalia citrina</i> (Roxb.) ex Fleming    | Combretaceae | Reraw      | Tree    | Mizo, Lai, Chakma, Mara | House construction, Furniture, Tool handle, Medicine                  | Aizawl, Lawngtlai, Saiha |
| 49. | <i>Tetrastigma bracteolatum</i> (Wall.) Planch. | Vitaceae     | Hruirithet | Climber | Mizo                    | Vegetable, Medicine   | Aizawl                   |
| 50. | <i>Willughbeia edulis</i> Roxb.                 | Apocynaceae  | Vuakdup    | Climber | Lai, Pang, Mizo         | Latex for making rubber   | Aizawl, Lawngtlai        |
| 51. | <i>Zizyphus jujuba</i> Mill.                    | Rhamnaceae   | Bawrai     | Tree    | Mizo, Lai, Chakma       | House construction, Tool handle, Firewood, Charcoal, Fodder, Medicine | Lawngtlai, Saiha         |

**Figure 1. Family wise distribution of different species.**

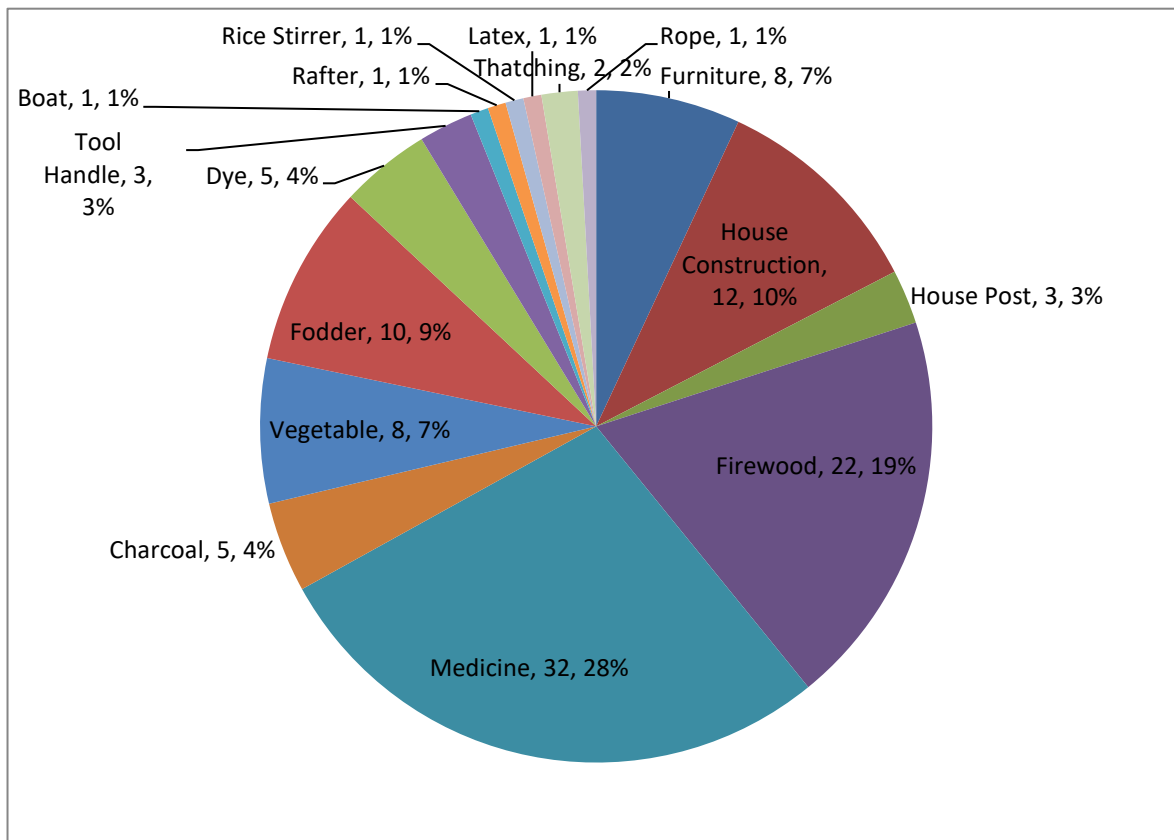


**Figure 2: Habit of the wild edible fruit species**

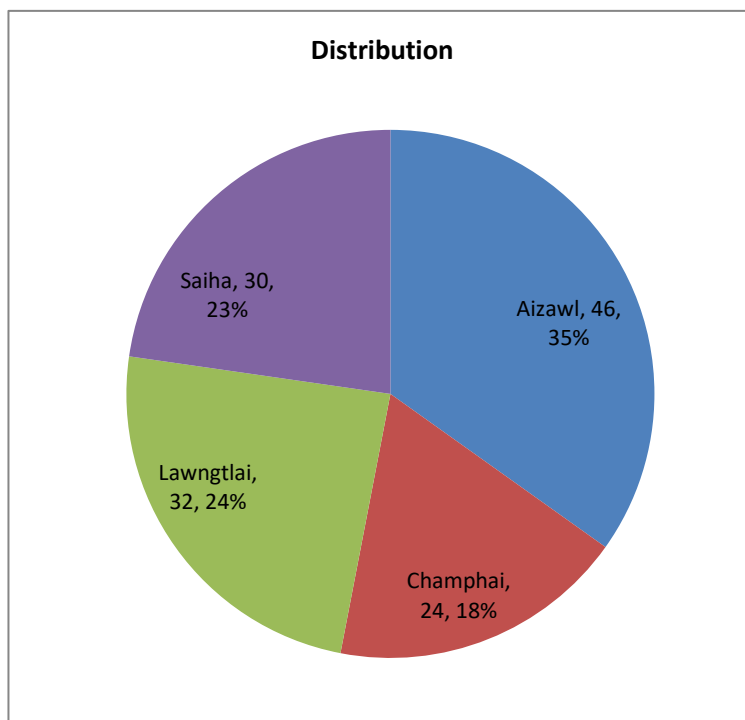




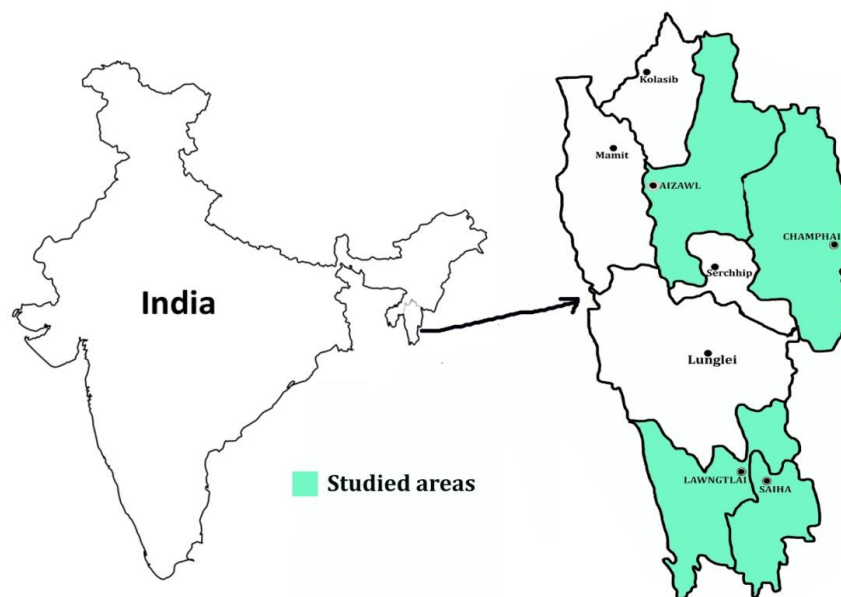
**Figure 3: Number of wild edible fruit species used by different ethnic groups.**



**Figure 4: Ethnobotanical uses of different wild edible fruit species**



**Figure 5: Distribution of wild edible fruit species in four districts of Mizoram**



**Figure 6: Map of Mizoram showing the four studied districts**

The information on the ethnobotanical uses of the different wild edible fruit species by different ethnic groups the dominant use with the largest number of species 32 (28%) for Medicine, followed by Firewood 22 species (19%), Fodder and House construction 12 species (10%) each, Furniture making and Vegetable 8 species (7%) each, Dye and Charcoal making 5 species (4%) each House post and Tool handle 3 species (3%) each, Thatching 2 species (2%) and boat making, Rafter, Rice stirrer, Latex and Rope making 1 species (1%) each. (Table 1 and Figure 4)

The study on the diversity status on the availability of wild edible fruit species in different districts show Aizawl district with the maximum number of species 40 (35%) followed by Lawngtlai 32 species (24%), Saiha 30 species (23 %) and Champhai 24 species (18%). (Table 1 and Figure 5).

Several methods of fruit use have been recorded. Ripe fruits are usually eaten raw, whereas unripe fruit are used as vegetable, mixed with curry, with dry fish also eaten with salt (Jeeva, 2009). Wild fruits have been important source of nutrients and the consumptions of these species are essential part of the diet of the people and this traditional knowledge is handed down from generation to generation (Kruba *et al.*, 2006). The past studies showed that different tribes of Northeast India (Gangwar and Ramakrishnan, 2000; Sankaran *et al.*, 2006; Jeeva, 2009) as well as in other parts of the world

and India (Jin *et al.*, 1999; Tardio *et al.*, 2006; Verheij and Coronel, 1991) have intensively used wild fruits which shows the diversification of knowledge among the indigenous people in region to region and from nation to nation (Jeeva, 2009).

#### CONCLUSION:

This study showed the rich repository of edible wild fruits in the region and the findings has significant implications for the conservation, management and usefulness in the traditional knowledge system of different species. It can contribute to introduce for cultivation of wild edible species in jhum gardens, home gardens, agroforestry, restoration of the traditional heritage of the region, promoting the sustainable use of different species, protect and promote the dietary habitat and improve the economy. The rich bioresources along with the indigenous knowledge are depleting fast due to various anthropogenic activities and urbanization. The wild fruits of the region provide opportunity for bioprospecting for the discovery of important nutritional value.

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